CLAIMS

1. A juvenile restraint system comprising

a juvenile seat,

a tether including a first end coupled to the juvenile seat and a second end adapted to be coupled to an anchor in a vehicle, the tether being arranged normally to have a predetermined length between the first and second ends, and

an energy absorber coupled to the tether and made of an elastic material and arranged to be stretched by the tether to vary from an initial state cooperating with the tether to establish the predetermined length of the tether to a deformed state cooperating with the tether to allow extension of the tether to an extended length greater than the predetermined length in response to application of a pulling force applied to the first end of the extensible tether owing to movement of the juvenile seat relative to the energy absorber.

2. The system of claim 1, wherein the tether includes a first tether strap providing the first end coupled to the juvenile seat and a second tether strap providing the second end adapted to be coupled to an anchor in a vehicle and the energy absorber includes a first strap mount coupled to a free end of the first tether strap, a second strap mount coupled to a free end of the second tether strap, and a deformable bridge arranged to interconnect the first and second strap mounts and configured to yield from an initial shape to allow movement of the first and second strap mounts away from one another in response to application of the pulling force applied to the first end of the first tether strap during deformation of the energy absorber to assume the deformed state and to recover the initial shape to move the first and second strap mounts toward one another during relaxation of the energy absorber to assume the initial state upon cessation of application of the pulling force applied to the first end of the first tether strap.

3. The system of claim 2, wherein the deformable bridge has a half-cylinder shape upon relaxation of the energy absorber to assume the initial state.

4. The system of claim 3, wherein each of the first and second strap mounts is a flat plate and the flat plates are arranged to lie in coplanar relation to one another.

5. The system of claim 3, wherein the first strap mount is formed to include a strap receiver slot receiving the free end of the first tether strap therein and the second strap mount is formed to include a strap receiver slot receiving the free end of the second tether strap therein.

6. The system of claim 2, wherein the first strap mount is formed to include a strap receiver slot receiving the free end of the first tether strap therein and the second strap mount is formed to include a strap receiver slot receiving the free end of the second tether strap therein.

7. The system of claim 6, wherein each of the first and second strap mounts is a flat plate and the flat plates are arranged to lie in coplanar relation to one another.

8. The system of claim 7, wherein the deformable bridge extends in a first direction away from the first and second strap mounts.

9. The system of claim 2, wherein the deformable bridge has a bowed shape upon relaxation of the energy absorber to assume the first shape.

10. The system of claim 2, wherein the second tether strap includes a loop at the free end thereof passing through a strap receiver slot formed in the second strap mount and a tether hook at the second end of the extensible tether to provide means for engaging an anchor in a vehicle to limit movement of the juvenile seat in the vehicle.

11. The system of claim 2, wherein the energy absorber has a football shape.

12. The system of claim 11, wherein the energy absorber is made of a thin sheet of elastic material.

13. The system of claim 11, wherein the deformable bridge comprises separate first and second V-shaped bridge sections, the first strap mount interconnects first distal ends of the first and second V-shaped bridge sections, and the second strap mount interconnects second distal ends of the first and second V-shaped bridge sections.

14. The system of claim 2, wherein the deformable bridge comprises separate first and second V-shaped bridge sections, the first strap mount interconnects first distal ends of the first and second V-shaped bridge sections, and the

second strap mount interconnects second distal ends of the first and second V-shaped bridge sections.

15. The system of claim 14, wherein the first V-shaped bridge section further includes a central portion arranged to interconnect the first and second distal ends of the first V-shaped bridge section and formed to include a C-shaped opening facing toward the second V-shaped bridge section and the second V-shaped bridge section further includes a central portion arranged to interconnect the first and second distal ends of the second V-shaped bridge section and formed to include a C-shaped opening facing toward the first V-shaped bridge section.

16. The system of claim 14, wherein the juvenile seat includes a seat bottom and a seat back extending upwardly away from the seat bottom to terminate at a top edge, the energy absorber is located adjacent to the seat back in a position between the seat bottom and the top edge of the seat back, the first tether strap extends along the seat back, and the second tether strap extends along the seat back and passes over the top edge of the seat back.

17. A juvenile restraint system comprising

a juvenile seat,

a tether including a first end coupled to the juvenile seat and a second end adapted to be coupled to an anchor in a vehicle, the tether being arranged normally to have a predetermined length between the first and second ends, and

an energy absorber coupled to the tether and made of an elastic material and arranged to be deformed by the tether to vary from an initial state cooperating with the tether to establish the predetermined length of the tether to a deformed state cooperating with the tether to allow extension of the tether to an extended length greater than the predetermined length in response to application of a pulling force applied to the first end of the extensible tether owing to movement of the juvenile seat relative to the energy absorber, wherein the juvenile seat includes a seat bottom and a seat back extending upwardly from the seat bottom and the energy absorber is retained between a loop formed in the tether and a portion of the seat back.

18. The system of claim 17, wherein the seat back includes a front side facing toward an occupant seated on the seat bottom and a rear side facing away

from an occupant seated on the seat bottom and the portion of the seat back is located on the rear side.

19. The system of claim 18, wherein the seat back further includes two fins appended to the rear side of the seat back and arranged to extend away from the front side of the seat back to locate the portion of the seat back therebetween and the energy absorber lies between the two fins and includes a first side wall facing toward a first of the fins and a second side wall facing toward a second of the fins.

20. The system of claim 17, wherein the energy absorber includes a curved wall positioned to engage the loop formed in the tether.

21. The system of claim 20, wherein the energy absorber further includes a flat wall engaging the portion of the seat back and first and second side walls extending from the flat wall to the curved wall and the seat back further includes a first fin extending away from the portion of the seat back and engaging the first side wall of the energy absorber and a second fin extending away from the portion of the seat back and engaging the second side wall of the energy absorber to locate the energy absorber between the first and second fins.

22. The system of claim 17, wherein the seat back includes a front side facing toward an occupant seated on the seat bottom and a rear side facing away from an occupant seated on the seat bottom, the portion of the seat back is located on the rear side, the seat back is formed to include first and second tether-receiving slots extending between the front and rear sides, the first tether-receiving slot lies between the seat bottom and said portion of the seat back, the portion of the seat back lies between the first and second tether-receiving slots, and the tether passes through the first and second tether-receiving slots and comprises, in sequence, a first portion extending along the front side to the first tether-receiving slot, a second portion extending along the rear side between the first and second tether-receiving slots and engaging the energy absorber, and a third portion extending from the second tether-receiving slot along the front side toward a top edge of the seat back.

23. A juvenile restraint system comprising

a juvenile seat,

a first tether strap coupled to the juvenile seat,

a second tether strap adapted to be coupled to an anchor in a vehicle, and

an energy absorber coupled to the first and second tether straps and made of an elastic material to yield in response to deforming forces applied to the energy absorber by the first and second tether straps during movement of the juvenile seat relative to the second tether strap during an impact to a vehicle carrying the juvenile seat.

24. The system of claim 23, wherein the energy absorber includes a first strap mount coupled to a free end of the first tether strap, a second strap mount coupled to a free end of the second tether strap, and a deformable bridge arranged to interconnect the first and second strap mounts and configured to yield from an initial shape to allow movement of the first and second strap mounts away from one another and then recover the initial shape to move the first and second strap mounts toward one another.

25. The system of claim 24, wherein the initial shape of deformable bridge is a bowed shape.

26. The system of claim 24, wherein the initial shape of the deformable bridge is a half-cylinder shape.

27. The system of claim 24, wherein the initial shape of the deformable bridge is a V-shape.

28. A juvenile restraint system comprising

a juvenile seat formed to include first and second tether-receiving slots arranged to lie in spaced-apart relation to one another to define an absorber platform therebetween,

a tether passing through the first and second tether-receiving slots to form a loop arranged to lie in confronting relation to the absorber platform, and

an energy absorber located in a space provided between the loop and the absorber platform, the energy absorber being made of an elastic material and arranged to be compressed by the tether against the absorber platform to vary from an initial state to a deformed state in response to movement of the loop toward the absorber platform during application of a pulling force to the tether to cause the tether to move through at least one of the first and second tether-receiving slots.

29. The system of claim 28, wherein the juvenile seat includes a seat bottom and a seat back extending upwardly from the seat bottom, the seat back includes a front side facing toward an occupant seated on the seat bottom and a rear side facing away from an occupant seated on the seat bottom, the seat back is formed to include the first and second tether-receiving slots, each slot has an opening in each of the front and rear sides, and the absorber platform is located on the rear side.

30. The system of claim 29, wherein the seat back further includes two fins appended to the rear side of the seat back and arranged to extend away from the front side of the seat back to locate the absorber platform therebetween and the energy absorber lies between the two fins.

31. The system of claim 29, wherein the energy absorber includes a curved wall positioned to engage the loop formed in the tether.